

# **EPA Superfund Explanation of Significant Differences:**

**WHITMOYER LABORATORIES**

**EPA ID: PAD003005014**

**OU 03**

**JACKSON TOWNSHIP, PA**

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## **EXPLANATION OF SIGNIFICANT DIFFERENCES No. 3 WHITMOYER LABORATORIES SUPERFUND SITE**

### **I. INTRODUCTION**

Site Name: Whitmoyer Laboratories Superfund Site

Site Location: Myerstown, Lebanon County, Pennsylvania

Lead Agency: U.S. Environmental Protection Agency, Region III  
(EPA or the Agency)

Support Agency: Pennsylvania Department of Environmental Protection (PADEP)

A Record of Decision (ROD) for the Whitmoyer Laboratories Superfund Site (Site) for Operable Unit Two (OU-2) was issued on December 17, 1990 and a ROD for Operable Unit Three (OU-3) was issued on December 31, 1990. This Explanation of Significant Differences (ESD) which modifies the OU-2 and OU-3 RODs is issued in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA), 42 U.S.C. § 9617(c), and 40 C.F.R. § 300.435(c)(2)(i).

This ESD No. 3 has been prepared to provide the public with an explanation of the nature of the changes made to the selected remedy identified in the RODs for OU-2 and OU-3; to summarize the information that led to the making of the changes; and to affirm that the revised remedy complies with the statutory requirements of CERCLA § 121, 42 U.S.C. § 9621. The proposed alternative does not fundamentally alter the remedy selected in the ROD for OU-2 or OU-3 with respect to scope, performance, or cost; therefore, a ROD amendment is not required. This ESD is incorporated into the Administrative Record for the Site.

New information became available following the issuance of the RODs for OU-2 and OU-3 which gave rise to the need for an ESD. Specific information acquired during the Remedial Design includes: (1) a detailed delineation of the lagoons which determined that approximately 6,890 cubic yards (cy) of hazardous lagoon wastes require treatment prior to disposal in an off-Site landfill; (2) the completion of bench-scale treatability tests which demonstrated the ability to successfully treat hazardous soils and lagoon wastes off-Site; and (3) the passage of the Phase IV Land Disposal Restrictions which provides an alternate treatment criterion for soils. The new information acquired and EPA's conclusions are discussed in more detail below.

## **II. SUMMARY OF THE SITE HISTORY, CONTAMINATION PROBLEMS, AND SELECTED REMEDY**

The Whitmoyer Laboratories Site is the location of a former veterinary feed additives and pharmaceuticals manufacturing facility. Production began at the Site in 1934 and in the mid-1950's, the facility began using arsenic in the production of feed additives. Other products produced included a coal-tar dip, used to treat skin disorders; piperazine, a worming agent; and sulfa drugs, used to inhibit bacterial growth. In addition to arsenic, a number of products manufactured by the facility contained aniline, an organic chemical derived from benzene.

The original Site owner, Clarence W. Whitmoyer, Sr. sold the facility to The Rohm and Haas Company in 1964. In 1978, The Rohm and Haas Company sold the facility to Beecham Inc., who in turn sold the facility to Stafford Laboratories, Inc. in 1982. Stafford Laboratories, Inc. filed for bankruptcy protection under Chapter 11 of the U.S. Bankruptcy Code in mid-1984 and continued operations at the Site until January 1987.

EPA began assessing Site conditions in 1984. However, when the facility closed in 1987, the Resource Conservation and Recovery Act (RCRA) Closure Plan had only been partially implemented. The Site was listed on the National Priority List (NPL) in 1986, and throughout 1987, EPA conducted numerous sampling activities, both on- and off-Site. In 1988, EPA removed approximately 400 drums from the Site while beginning a fund-lead Remedial Investigation/Feasibility Study. A ROD for Operable Unit One (OU-1) was issued in June 1989 for the consolidation, removal and treatment of concentrated liquids and decontamination of 32 tanks and vessels. The Remedial Action for OU-1 was completed in September 1990.

The ROD for OU-2 was issued in December 1990 and addressed the concentrated wastes in the concrete vault, wastes abandoned in two groups of lagoons, products and miscellaneous materials abandoned in buildings, and the buildings and related structures. A complete description of the selected remedy as well as EPA's rationale for the decision is presented in the ROD for OU-2. The major components of the ROD for OU-2 are:

- ! On-Site incineration of the high organic content vault wastes, contents of buried drums located adjacent to the vault, residual materials remaining in tanks and process vessels, miscellaneous products and feedstocks, and combustible demolition debris exhibiting the RCRA arsenic toxicity characteristic;
- ! Fixation of lagoon wastes, incineration residuals, and low organic content vault wastes;
- ! Surface cleaning and demolition of contaminated Site structures;
- ! Coating and sealing all noncombustible, permeable demolition debris exhibiting the RCRA arsenic toxicity characteristic;
- ! Surface cleaning the noncombustible, impermeable demolition debris exhibiting the RCRA arsenic toxicity characteristic;

- ! Salvaging non-hazardous demolition debris, as feasible; and
- ! Disposal of the treated wastes, the untreated non-hazardous lagoon wastes, the untreated non-hazardous miscellaneous products/feedstocks, and the untreated non-hazardous demolition debris that is not salvaged in off-Site landfills.

On December 30, 1990 the final ROD for OU-3 was issued. It addressed contaminated soils and adjacent sediments, non-hazardous buildings, and groundwater. The major components of the remedy included:

- ! Treatment of heavily contaminated soil and sediments;
- ! Capping of remaining contaminated soils and sediments;
- ! Building demolition and salvaging or disposal of debris; and
- ! Pumping and treatment of contaminated groundwater.

On December 28, 1994 EPA issued an ESD (ESD No. 1) that modified the remedy to allow the following materials to be incinerated at an off-Site facility:

- ! Laboratory bottles;
- ! Wooden debris from the vault;
- ! Transformers (with and without detectable PCBs);
- ! Crushed drums with adhering tar-like material;
- ! "Unexpected" solid and liquid wastes from the vault;
- ! Miscellaneous materials from on-Site buildings;
- ! Wooden tanks and process vessels; and
- ! Combustible demolition debris exhibiting the RCRA arsenic toxicity characteristic.

A second ESD (ESD No. 2) was issued on November 7, 1995 that selected off-Site treatment and disposal of additional wastes originally determined to be treated on-Site. ESD No. 2 documented the decision to: 1) incinerate the aniline still-bottom tars and carbon/tar wastes excavated from the vault at Off-Site facilities (several incineration facilities were subsequently used); 2) stabilize the calcium arsenate sludge at an off-Site facility; 3) conduct off-Site incineration of wastes with elevated levels of organic compounds, (i.e., fuel and waste oils, aniline residuals, and organic product residuals); and 4) stabilize wastes with a limited amount of organic compounds (i.e., floor sweepings, concrete residuals, wood, and debris) at an off-Site facility.

An Amendment to the ROD for OU-2, the third modification to the selected remedy, was issued on May 12, 1998. The Amendment to the ROD for OU-2 selected off-Site stabilization and disposal of vault soils. The original remedy selected for this waste stream was on-Site incineration followed by stabilization of residual wastes and off-Site disposal. The third modification to the remedy eliminated the need to construct an on-Site incinerator by allowing the final waste stream originally selected for on-Site incineration to be taken to an off-Site location for treatment and disposal.

The three modifications to the selected remedy were strongly supported by the community, the elected officials, and PADEP, all of whom opposed the selection of on-Site incineration in the original remedy. On-Site incineration was selected in the original ROD for OU-2 because off-Site facilities were not available to incinerate the arsenic-contaminated wastes in 1990.

### III. BACKGROUND ON LAGOONS

The lagoons at the Whitmoyer Laboratories Site were formed during past Site operations as follows. Prior to 1964, process wastewater from Site operations was treated with lime, generating a calcium-arsenic sludge, and reportedly discharged into an on-Site lagoon. This lagoon was excavated in 1964 and the calcium-arsenic sludge was placed in an on-Site concrete vault. Beginning in 1965, extracted groundwater from an on-Site pump and treat system was treated with ferric sulfate to precipitate iron-arsenic compounds, and then discharged into the original lagoon, seven newly created lagoons in the same area and additional lagoons to the west. The lagoons to the west were eventually excavated and consolidated into the eastern lagoon area (hence the terms "excavated lagoons" and "consolidated lagoons"). The consolidated lagoons were then reportedly capped with approximately one foot of clean soil. The entire lagoon area covers approximately two acres. It should be noted that for purposes of the Remedial Design and Remedial Action, the lagoons were separated from other on-Site activities and are referred to as Operable Unit Five.

The original selected remedy for the lagoon wastes as described in the OU-2 ROD is bulk excavation, followed by on-Site iron-based fixation of hazardous lagoon wastes and off-Site disposal of the treated hazardous wastes and untreated non-hazardous wastes. According to the OU-2 ROD, lagoon wastes were defined as iron-arsenic sludge and admixed soils which contain greater than 10,000 mg/kg (1 percent) arsenic.

The *Draft Consolidated Lagoons Delineation Report, Operable Unit Five* (May 13, 1998) describes the following three waste streams which characterize the consolidated lagoon area:

- ! 3,840 cy of non-hazardous lagoon materials (< 10,000 mg/kg total arsenic and <5 mg/L TCLP-arsenic);
- ! 5,950 cy of non-hazardous lagoon wastes (> 10,000 mg/kg total arsenic and < 5 mg/L TCLP-arsenic); and
- ! 6,890 cy of hazardous lagoon waste (> 5 mg/L TCLP-arsenic).

The ROD for OU-2 required on-Site fixation followed by off-Site disposal of the hazardous lagoon wastes and off-Site disposal of the non-hazardous lagoon wastes without treatment. Non-hazardous lagoon materials were to be treated as soils since they did not meet the ROD definition for lagoon wastes (containing greater than 1% or 10,000 mg/kg total arsenic).

#### **IV. DESCRIPTION OF SIGNIFICANT DIFFERENCES AND THE BASIS FOR THOSE DIFFERENCES**

Additional information became available after the issuance of the RODs for OU-2 and OU-3 as a result of the implementation of the Remedial Design. In addition, EPA recently developed new criteria for the treatment of contaminated soils. As a result of this additional information described below, EPA has determined that it is appropriate to treat the contaminated lagoon materials and heavily contaminated unsaturated soils at an off-Site treatment facility instead of treating the wastes on-Site as required by the OU-2 and OU-3 RODs. Additional sampling conducted during the Remedial Design has refined the areal extent of soil that requires excavation and EPA's new soil criterion has modified the volume of soils that require treatment prior to disposal.

As discussed in the May 1996 *Lagoon Wastes Characterization Results Report; Operable Unit Five* (Lagoons Characterization Report), the applicable EPA hazardous waste designation for the hazardous lagoon waste is D004 (arsenic). Because there are no Underlying Hazardous Constituents (UHCs) in the lagoon wastes requiring treatment to meet the Universal Treatment Standards (UTSs), the corresponding applicable Land Disposal Restrictions (LDR) treatment standard for the treated materials is 5.0 mg/L TCLP-arsenic.

As described earlier the excavated lagoons were formed after lagoon materials were consolidated and the area backfilled with soil. Data generated during the Remedial Investigation (RI) for the excavated lagoon area indicate that total arsenic concentrations ranged from 38 to 41,000 mg/kg. The highest concentrations of total arsenic were present in RI samples containing sludge-like materials. Additional sampling of the excavated lagoon area was conducted subsequent to the ROD for OU-2. Nine borings and twenty-nine samples were collected in excavated lagoon number 15, which was selected because it appeared representative of the entire excavated lagoon area. The results of this work are summarized in the Lagoon Characterization Report, in which it was found that total arsenic concentrations range from 3.5 to 1,840 mg/kg. Of four total TCLP analyses conducted on samples from the excavated lagoon, the highest value was 3.01 mg/L TCLP arsenic, which is below the regulatory limit of 5 mg/L TCLP.

When both the RI data and the supplemental post-ROD data are evaluated together, the data suggest that the majority of the excavated lagoon soils are non-hazardous and should thus be considered as part of the overall remedy for contaminated soils. Additional sampling is currently underway in this area and the results will be provided in the final delineation report for soils and sediments. All hazardous soils in the excavated lagoon area will be remediated in a manner consistent with the other hazardous Site soils.

In August 1995, GeoTrans conducted additional groundwater analyses to evaluate the relative impact to groundwater from the various potential source areas at the Site. These data were presented in the *Remedial Design, Additional Well Installation and Sampling Report* (GeoTrans, June 1996). The results indicate that arsenic concentrations in the groundwater do not appear to change significantly as it crosses the excavated lagoons. Thus, the historic formation of the excavated lagoons, the relatively low levels of arsenic in the excavated lagoon area, the low levels of TCLP arsenic, and the apparent relatively lesser impact to ground water indicate that the excavated lagoons behave in a manner more similar to soils than lagoons. For these reasons, EPA has determined to address the excavated lagoons as soils during the implementation of the remedy selected in the ROD for OU-3.

According to the ROD for OU-3, the selected remedy for heavily contaminated unsaturated soils is excavation, followed by on-Site iron-based fixation, and off-Site disposal. Heavily contaminated soils are defined as those for which TCLP levels of arsenic exceed 5 milligrams per liter (5 mg/L).<sup>1</sup> This is the same criteria which defines hazardous soils under RCRA.

EPA originally estimated that approximately 61,000 cy of heavily contaminated soils and sediments existed at the Site. The distribution of saturated vs. unsaturated soils was unknown at that time. The volume of heavily contaminated unsaturated soils is now anticipated to be approximately 5,000 cy. Additionally, as a result of the recent Phase IV Land Disposal Restrictions (LDR) (63 Fed. Reg. 2855 (May 26, 1998)) effective August 24, 1998, an alternate treatment criterion for soils is codified at 40 C.F.R. § 268.49 (i.e., treatment to achieve 90% reduction for constituents requiring treatment and capped at 10 times the UTSs). Therefore, for D004 soils, rather than requiring treatment for arsenic to the UTS of 5.0 mg/L, 40 C.F.R. § 268.49 allows an alternate treatment standard for soils of a 90% reduction in TCLP-arsenic concentrations, capped at 50 mg/L. Therefore, while all 5,000 cy of heavily contaminated unsaturated soils would still need to be excavated and removed from the Site, the soils requiring treatment prior to disposal would be those exhibiting TCLP-arsenic concentrations greater than 50 mg/L and to the UTSs for all UHCs. The volume of soil requiring treatment is being refined based on the data collected during the soil delineation program.

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<sup>1</sup> Heavily contaminated soils were originally defined by the ROD as soils with arsenic concentrations greater than 1,000 mg/kg. Based on a June 20, 1995 letter to EPA from the Whitmoyer Laboratories Private Study Group (WLPSG) and accepted by EPA on March 11, 1996, the defining criteria for heavily contaminated soils was modified to 5 mg/L TCLP-arsenic. The selection of 1,000 mg/kg of arsenic as the action level for treatment in the ROD was based on a statistical correlation between total arsenic concentrations in soil and arsenic concentrations in the resulting leachate. This correlation was developed by EPA using the standard TCLP testing procedures. Rather than rely upon the statistical correlation between total and leachable arsenic, EPA determined it was appropriate to directly measure the leachability of the soil (i.e., conduct TCLP analysis) to determine if treatment was required prior to disposal.

## Results of Bench-Scale Testing

Extensive bench-scale fixation treatability testing was conducted by Enreco, Inc. to identify fixation formulations capable of achieving the LDR treatment standard of 5.0 mg/L arsenic for the hazardous lagoon wastes and heavily contaminated unsaturated soils. The results from this testing were submitted to EPA and PADEP in the September 23, 1997 *Bench-Scale Treatability Testing Results Report, Operable Unit Five (Excluding the Excavated Lagoon and Including the Heavily and Organically Contaminated Unsaturated Soils)*. The study was performed on samples collected in June 1997, in accordance with the May 13, 1997 *Revised Protocol for Bench-Scale Treatability Testing* from areas where maximum levels of leachable arsenic were previously observed (as reported in the October 1996 *Soils/Sediments Characterization Results Report, Operable Unit Three* and November 1989 *NUS Remedial Investigation (RI) Report*).

The results of the bench-scale testing identified a formulation that successfully treated both the hazardous lagoon wastes and soils to the LDR treatment standard in-place at that time (5 mg/L TCLP- arsenic). In January 1998, Enreco, Inc. conducted additional bench-scale treatability testing on more heavily contaminated lagoon wastes, found during the delineation sampling conducted in November 1997. The previously identified fixation formulation for hazardous lagoon wastes again proved to be successful. The results of this test are included in Whitmoyer Laboratories Private Study Group's (WLPSG's) April 30, 1998 addendum to the *Treatability Report, Response to USEPA Comments on Bench-Scale Treatability Testing Results Report and Presentation of Results from Follow-up Bench-Scale Testing on Consolidated Lagoon Materials*.

## Summary of New Information Obtained Since the OU-2 and OU-3 RODs

Since the OU-2 and OU-3 RODs were issued, several pieces of new information with respect to the consolidated lagoons and heavily contaminated unsaturated soils have been identified. As described above, EPA originally estimated that up to 24,000 cy of lagoon materials might eventually require treatment. Because of additional delineation refinements that have occurred during various Site investigations, it is now expected that 6,890 cy of hazardous lagoon wastes will need to be treated. The volume of heavily contaminated unsaturated soils to be treated has similarly changed based on additional delineation work and the recent modifications in regulatory and administrative requirements. In addition, the ability to successfully treat these materials off-Site has since been demonstrated.

Based on the characteristics of the hazardous lagoon waste and heavily contaminated unsaturated soils, the applicable treatment requirements for these wastes, and its pre-design work to date, EPA has determined that the off-Site fixation of hazardous materials is consistent with the nine evaluation criteria for remedy selection established under the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), as discussed



below.

Off-Site fixation of the hazardous lagoon waste and heavily contaminated unsaturated soils would provide a level of overall protection at least equivalent, if not greater than that provided by on-Site fixation. Fixation to meet applicable LDR treatment standards at an off-Site Subtitle C facility would provide protection of human health and the environment by significantly reducing the risk of exposure to arsenic by effectively immobilizing arsenic, which is the principal hazardous constituent in the lagoon waste and heavily contaminated unsaturated soils. Risk of on-Site exposure to fugitive dust and reagent emissions would be prevented. Furthermore, transportation risk would be reduced given the lower volume of wastes to be transported (since treatment reagents would not be added to the waste on-Site prior to off-Site transport), and the low acute hazard posed in the event of any spill of untreated lagoon waste or contaminated soils.

Fixation of the hazardous lagoon waste and heavily contaminated unsaturated soils to meet applicable LDR treatment standards and disposal of the treated waste at a Subtitle C facility eligible to accept CERCLA wastes pursuant to 40 C.F.R. § 300.440 (Procedures for Planning and Implementing off-Site Response Actions) would comply with State and Federal Applicable or Relevant and Appropriate Requirements (ARARs).

The long-term effectiveness and the reduction in toxicity and mobility of materials treated at an off-Site facility would be the same as that for on-Site fixation. In addition, the off-Site fixation of the hazardous lagoon waste and heavily contaminated unsaturated soils could be completed in a shorter period of time than that needed for on-Site fixation because of the reduced remedial design efforts for off-Site versus on-Site fixation. Potential risk associated with transportation of materials and exposure to treatment emissions is expected to be reduced with off-Site fixation because of the lower quantity of wastes that would require transportation and because chemicals would not have to be transported to the Site for on-Site fixation. The risk posed by a possible spill of untreated lagoon waste or soils during transportation would be low given the physical composition of the waste.

Based on the expected reduced volume of hazardous lagoon waste and heavily contaminated unsaturated soils to be disposed, the bench-scale success in treating the waste to acceptable levels, and the pre-design evaluation of an eligible, Subtitle C treatment facility, EPA is confident that off-Site fixation and disposal is implementable.

The present-worth cost for off-Site fixation of the hazardous lagoon waste and heavily contaminated unsaturated soils is expected to be lower than that for on-Site fixation due to reduced transportation costs, and reduced on-Site engineering costs since treatment would occur off-Site. The approximate cost-savings for modifying the remedy to allow for the off-Site treatment of wastes is \$4,250,000.

Based on public meetings held to date, EPA expects the community would support

off-Site, rather than on-Site, fixation because the community has supported all three of the previous modifications to the ROD for OU-2 which also included changes to treat various waste streams at off-Site treatment facilities. The alternate treatment criteria for soils established by the final rule, Phase IV Land Disposal Restrictions (May 26, 1998), does not modify the extent of contaminated soils that require excavation, however it does reduce the amount of material that will require off-Site treatment prior to disposal. Community concerns regarding this new regulation are not anticipated since the alternate treatment requirements do not change the location or volume of soil that will be excavated. Furthermore, the potential for off-Site treatment of lagoon wastes was discussed by EPA during a public meeting on February 10, 1998 and no objections or concerns were raised by the citizens present regarding this matter.

## **V. SUPPORT AGENCY COMMENTS**

All of the above changes to the remedy have been coordinated with representatives of PADEP pursuant to 40 C.F.R. § 300,435(c)(2). PADEP submitted a letter on October 29, 1998 concurring with the changes to the selected remedy as described in this ESD.

## **VI. AFFIRMATION OF THE STATUTORY DETERMINATIONS**

EPA has determined that the revised remedy complies with the statutory requirements of CERCLA § 121, 42 U.S.C. § 9621. Considering the new information that has been developed and the changes that have been made to the selected remedy, EPA believes that the remedy remains protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to this Remedial Action as described in the RODs for OU-2 and OU-3, and is cost-effective. In addition, the revised remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this Site.

## **VII. PUBLIC PARTICIPATION**

This ESD and the supporting documents which contain the information which form the basis for modifying the selected remedies, have been included in the Administrative Record for this Site. The Administrative Record also includes the RODs for OU-1, OU-2 and OU-3, and all documents that formed the basis for EPA's selected remedy. The Administrative Record is available for public review at the locations listed below:

U.S. EPA, Region III  
1650 Arch Street  
Philadelphia, PA 19103-2029  
Hours: Mon. - Fri., 9:00 a.m. - 4:00 p.m.

Whitmoyer Community Library  
199 North College Street  
Myerstown, PA 17067

A notice of availability of these documents will be published in the Lebanon Daily News in late-November 1998. An informational meeting to discuss the progress of the clean-up and the modifications to the selected remedy as described above, will be held on December 1, 1998 at the Jackson Township Building located in Myerstown, Pennsylvania.

11/16/98

Date

Pete W. Schenk

**Abraham Ferdas, Director**  
**Hazardous Site Cleanup Division**